NAD 2100

POWER AMPLIFIER

MONITOR SERIES

INSTRUCTIONS FOR INSTALLATION AND OPERATION

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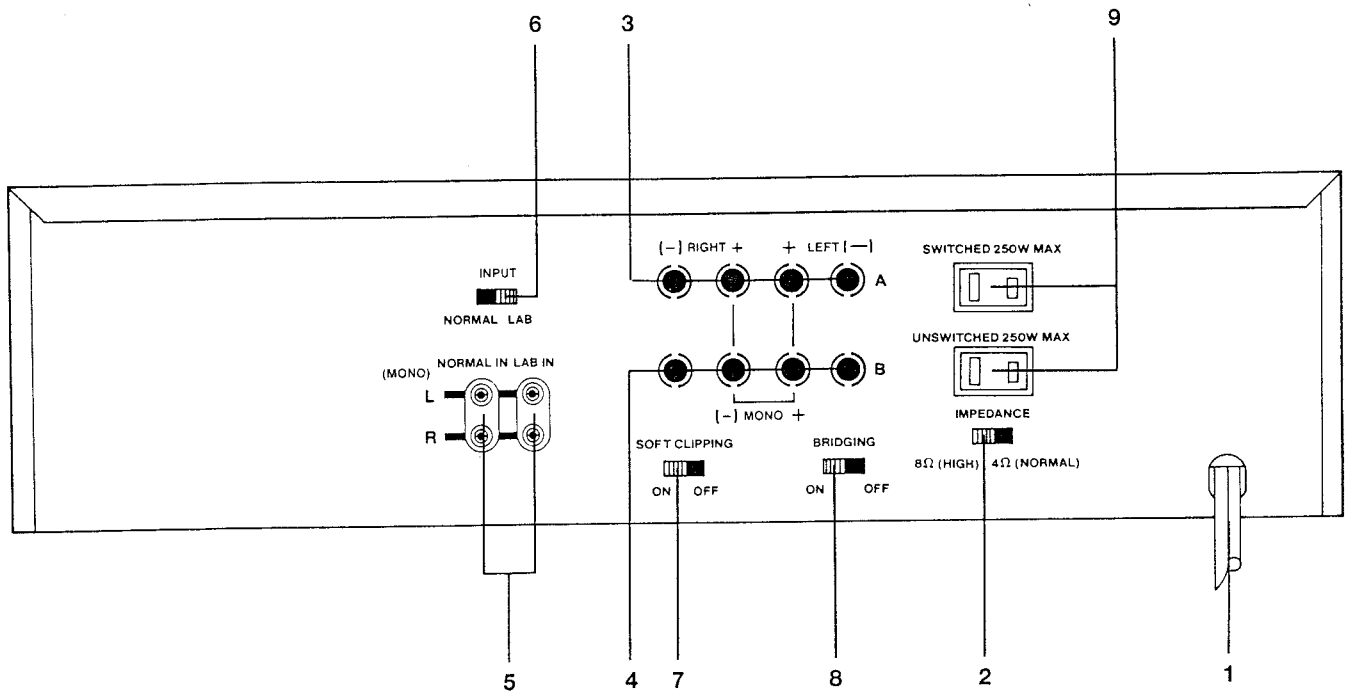

FRONT PANEL

1. Power.
2. Speaker Selector.
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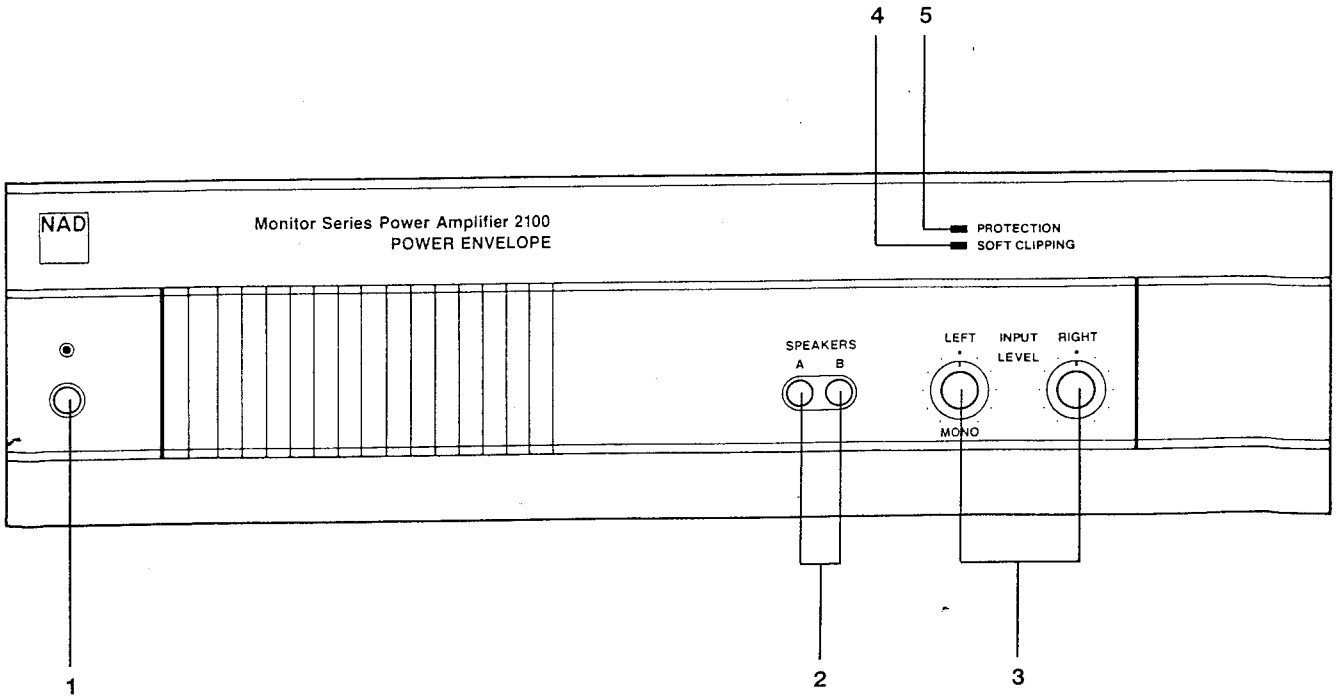


A NOTE ON INSTALLATION

This unit may be installed on any sturdy, level surface. Since its power transformer generates a magnetic hum field of moderate strength, a turntable (especially one with a moving-coil pickup cartridge) should not be located directly to the left of the amplifier nor directly above it.

The amplifier generates a modest amount of heat and thus requires some ventilation. Do not place it on a rug or other soft surface that it could sink into, obstructing the air inlets on its bottom. And be careful not to obstruct the air outlet grille on the top cover.

CAUTION: To prevent a fire or shock hazard, do not permit liquid or moisture to enter the amplifier. If liquid is accidentally spilled on it, immediately shut off its power and unplug its AC power cord. Allow sufficient time for complete evaporation to occur before operating the amplifier again. (If the liquid is anything but water and/or alcohol, the amplifier should be examined by a service technician before power is applied to it.)

Do not open the amplifier, or attempt to modify or repair it yourself. Refer all servicing to a qualified technician.

REAR PANEL CONNECTIONS

1. AC LINE CORD

Plug the AC line cord into a nearby wall outlet that provides the correct AC power line voltage, or into a switched convenience outlet on your preamp.

2. IMPEDANCE SELECTOR

The impedance of a loudspeaker varies with frequency, and in many loudspeakers the impedance is lowest at the frequencies where the highest power demands occur in music. In many "8Ω" loudspeakers this minimum impedance is from 4 to 6 ohms, and in "4Ω" speakers the minimum is typically 3 ohms. If you connect two sets of speakers to the amplifier, their combined impedance is approximately half the impedance of either.

For these reasons, all NAD amplifiers and receivers are designed to produce maximum power output into impedances of 2 to 6 ohms at the 4Ω (NORMAL) setting of the Impedance selector. If you are not sure of the true impedance of your speakers, or if you are connecting two pairs of speakers, leave the Impedance switch at 4Ω (NORMAL).

If you are using a single pair of loudspeakers whose true impedance is above 6 ohms at all frequencies, you can optimize the amplifier for maximum power delivery at this higher impedance by re-setting the switch to 8Ω (HIGH).

To prevent accidental re-setting, the Impedance switch is held by a slotted bracket which is fastened by a screw next to the switch. Use a small screwdriver to loosen the bracket screw, turning it about a half-turn counterclockwise, and then slide the switch to the 8Ω (HIGH) position. The bracket will move with the switch. Tighten the screw to secure the switch in its new position.

CAUTION: If the impedance switch is set to 8Ω (HIGH) with loudspeakers whose true impedance is lower than 6 ohms, or with two pairs of speakers connected in parallel, the amplifier will tend to overheat and shut down when operated at high output levels. The amplifier will resume normal operation after it cools; but such abuse could also cause internal fuses to blow in order to protect the amplifier. If this occurs, return the amplifier to your dealer for service.

3. SPEAKERS A

Connect the wires from your primary loudspeakers to the upper (A) set of speaker terminals. The amplifier is equipped with special high-current binding-post speaker terminals to handle the highest peak power levels that may occur in the "bridged" mode or with low-impedance speakers. Connect the loudspeakers with heavy-duty (16-gauge or thicker) stranded wire. Heavy-duty wiring is especially desirable if you are using speakers of low impedance or two pairs of speakers wired in parallel.

Each binding post consists of a threaded metal shaft and a plastic screw-on bushing. Connections may be made in either of two ways:

(1) A lateral opening in the base of each terminal accepts bared wires up to 14 gauge in thickness. Separate the two conductors of the cord, and strip off about a half-inch (1 cm) of insulation from each. In each conductor, twist together the exposed wire strands. Unscrew the colored plastic bushing a few turns, insert the wire into the hole in the base of the terminal, and screw the bushing down tight until it grasps the wire and holds it securely.

Connect the wires from the left-channel speaker to the (L+) and (L−) terminals and the wires from the right-channel speaker to the (R+) and (R−) terminals. Check to be sure that no loose strand of wire is touching any adjacent terminal or the amplifier chassis.

(2) A spring-type banana plug may be inserted axially into the end of each binding post. The binding posts have the ¾-inch (19 mm) spacing required to accept standard dual-banana plugs. Purchase dual-banana plugs and install them on your speaker cables (or purchase speaker wires with dual-banana plugs already installed), and plug them into the binding-post terminals.

Phasing. Stereo speakers must operate in phase with each other in order to yield a good stereo image and to reinforce rather than cancel each other's output at low frequencies. If your speakers are easily moved, their phasing can easily be checked. Make the connections to both speakers, place the speakers face-to-face only a few inches apart, play some music, and listen. Then swap the connection of the two wires at the back of ONE of the speakers, and listen again. The connection which produces the fullest, boomiest bass output is the correct one. Connect the wires securely to the speaker terminals, being careful not to leave any loose strands of wire that might touch the wrong terminal and create a partial short-circuit; then move the speakers to their intended locations.

If the speakers cannot easily be set face-to-face, then phasing must rely on the "polarity" of the connecting wires. The speaker terminals on the amplifier are labeled (+) and (−) in each channel. The terminals at the rear of the speakers are also marked for polarity, either via red and black connectors or by labels: "+", "1", or "8" ohms for positive, "−", "0", or "G" for negative. As a general rule the red (+) terminal on the amplifier is to be connected to the red (positive) terminal of the speaker, in each channel.

To facilitate this, the two conductors comprising the speaker wire in each channel are different, either in the color of the wire itself (copper vs. silver) or in the presence of a small ridge or rib pattern on the insulation of one conductor. Use this pattern to establish *consistent* wiring to both speakers of a stereo pair. Thus if you connect the copper colored wire (or ribbed insulation) to the (+) amplifier terminal in the Left channel, do the same in the Right channel. At the other end of the wire, if you connect the copper colored wire (or the ribbed insulation) to the red or positive terminal on the left-channel speaker, do the same at the right-channel speaker.

4. SPEAKERS B

A second pair of loudspeakers may be connected to the amplifier, using the lower "B" group of terminals, in the same manner as the connections made to the upper A terminals.

If the second pair of speakers is located near the first pair and will be played simultaneously, then they must be correctly phased with respect to the first pair as well as with each other. But if the second pair of speakers is located away from the first pair (in another room, for example) or will not be played at the same time as the first pair, then their phasing need not match that of the first pair. Of course, as with any stereo speakers, the second pair still must be in phase with each other.

The SPEAKERS B terminals may also be used to connect an adapter unit for electrostatic headphones. The black "−" terminals in each channel share a common ground.

Another useful option for the SPEAKERS B terminals is to connect a second pair of speakers wired for "ambience recovery," enhancing the apparent spaciousness of stereo recordings. Locate a pair of small loudspeakers along the side walls of the listening area, slightly behind the main listening area and as far as possible to the left and right. (Often it is useful to aim such speakers upward or toward the rear, so that their sound reflects randomly off the walls before reaching you.) Connect a wire from the (L+) terminal to the positive terminal of the left-rear speaker, and a second wire from the (R+) terminal to the positive terminal of the right-rear speaker. Make no connection to the (L−) and (R−) terminals on the amplifier; instead, connect a wire from the negative terminal of the left-rear speaker to the negative terminal of the right-rear speaker. Thus wired, these rear speakers receive the left-minus-right "difference" portion of the composite stereo signal.

5. INPUTS (Normal and Lab)

Before making or changing input connections to the power amplifier, make certain that its Power is switched OFF.

Connect the signal cable from your preamplifier either to the NORMAL input jacks or to the LAB input jacks.

The NORMAL inputs contain minimum-phase infrasonic and ultrasonic filters, whose purpose is to remove non-musical signals at frequencies below 10 Hz and above 40 kHz (due to turntable rumble, disc warps, radio-frequency interference, tracing distortion, etc.). These inputs should be used, especially if your preamplifier lacks such filtering.

The LAB inputs bypass these filters, providing extended response at infrasonic and ultrasonic frequencies.

6. LAB/NORMAL SELECTOR

If you connect to the NORMAL inputs, set this switch to the NORMAL position. If you connect to the LAB inputs, set the switch at LAB. Signals fed into the LAB inputs go directly to the amplifier circuit, without passing through the switch contacts.

The input signal at the NORMAL inputs is filtered to remove unwanted interference below 10 Hz and above 40 kHz. At the NORMAL setting of the switch, the bandpass-filtered signal is fed both to the LAB IN jacks and to the amplifier circuit. Therefore, when using the NORMAL inputs you can daisy-chain amplifiers together by connecting a cable to the LAB IN jacks to take out the filtered signal and feed it to another power amp.

NOTE: The Normal/Lab switch is not a conventional "input selector." You cannot connect different signal sources to the Normal and Lab inputs and use this switch to choose between the two signals.

7. SOFT CLIPPING

When an amplifier is overdriven beyond its specified power output it normally produces "hard clipping" of the signal with harsh distortion and power-supply buzz as the output transistors saturate. The NAD Soft Clipping circuit gently limits the output waveform and minimizes audible distortion when the amplifier is overdriven. If your listening involves moderate peak power levels, the Soft Clipping may be left OFF. But we recommend that it be switched ON when playing music at very high levels that might exceed the amplifier's power capacity.

8. BRIDGING

This switch "bridges" the two power amplifier channels to form a monophonic amplifier with more than double the output power. To convert to bridged operation, the following procedure should be followed.

(1) Switch OFF the POWER.

(2) Be sure that the IMPEDANCE switch is set to 4Ω (NORMAL). If it is at 8Ω (HIGH), re-set it to 4Ω (NORMAL).

NOTE: In the bridged mode the loudspeaker's impedance is effectively halved as "seen" by the amplifier. An 8-ohm load looks like 4 ohms, a 4-ohm load looks like 2 ohms, and pairs of 4-ohm speakers operated in parallel will look like a 1-ohm load. Driving paralleled low-impedance speakers to

high levels will cause the amplifier to overheat and shut down, or may cause internal fuses to blow in order to protect the amplifier. For best results the bridging mode should be used with a single 8-ohm or higher impedance speaker in each channel. In either case, the Impedance switch should be set to 4 ohms.

(3) Disconnect any signal cables from the input jacks. Decide whether this amplifier will be driving the Left or Right speaker. Connect the corresponding (left or right) signal cable from your preamplifier to one of the L input jacks of this amplifier (either LAB or NORMAL, as you prefer.)

In the bridged mode the amplifier is driven only through its L (Left) input (and the volume of the Normal input is adjusted with the left input control) even though it may be connected to the "Right " speaker. If another NAD 2100 amplifier in bridged mode is used for the second stereophonic channel, it also will be driven through an L input , regardless of whether it is used to drive the Left or Right loudspeaker.

NOTE: When using a NAD 3100 or 7100 for the other channel, use the 2100's LAB input. This ensures proper gain and response matching.

(4) Disconnect any wires from the SPEAKERS terminals. Select the wire from the speaker that will be driven by this bridged amplifier. Connect its "positive" conductor to the L+ terminal and its "negative" conductor to the R+ terminal (i.e. the two red terminals in the upper row). DO NOT connect any wires to the black terminals (L− and R−).

CAUTION: In the bridged mode the speaker wires must be "floating" with respect to the circuit ground. Do NOT connect the speaker wires to anything that shares a common ground between stereo channels (such as some speaker switches or adapters for electrostatic headphones), nor to anything which shares a common ground with the amplifier's inputs (such as a switching comparator or a distortion analyzer).

(5) After the preceding conditions have been satisfied, re-set the Bridging switch. It is held in place by a plastic bracket fastened by two screws. Use a small screwdriver to loosen the bracket screws, turning each about a half-turn counterclockwise; then slide the switch to ON (MONO). The bracket will move with the switch. Re-tighten the screws to secure the switch in its new position. Finally, turn the power on.

(6) To return the amplifier to normal stereo operation at a later date, first turn off the power. Loosen the bracket screws, re-set the Bridging switch to OFF (STEREO), and tighten the bracket screws to prevent the switch from being moved accidentally. Restore normal Left and Right input connections, and re-connect loudspeaker wires to the speaker terminals as described above under SPEAKERS.

9. AC CONVENIENCE OUTLETS

The AC power line cords of other stereo components may be plugged into these accessory outlets. The SWITCHED outlet is intended for all-electronic products (e.g., a tuner, equalizer, or other signal processor), and will be switched on and off by the amplifier's main POWER button. The UNSWITCHED outlet should be used to power products involving mechanical operations (e.g., a turntable or tape deck); such products should be switched on and off with their own power switches.

The UNSWITCHED outlet can also be used to power any device containing a clock timer, or a digital tuner that requires uninterrupted AC power to maintain station tuning information stored in its memory.

NOTE: For European units there is only one AC outlet (SWITCHED).

FRONT PANEL CONTROLS

1. POWER

Press the Power button to turn on the amplifier. The green LED glows when the power is on. Press Power button again to switch the amplifier off.

2. SPEAKER SELECTOR

When only button "A" is engaged, sound is heard only from the loudspeakers connected to the upper (A) speaker terminals on the rear panel. When only button "B" is depressed, the speakers a terminals are shut off and sound is heard only from the loudspeakers connected to the lower (B) speaker terminals.

If A and B are both pressed, the amplifier's output power is fed to both sets of speakers in parallel. If both A and B are disengaged (with the buttons OUT), both sets of speakers are silenced.

Thus if you have your main stereo speakers wired to the "A" terminals and a set of extension speakers wired to the "B" terminals, you can choose to hear only the main speakers (by pressing button A), only the extension speakers (by disengaging button A and pressing button B), or you can activate both by depressing both buttons.

If you have connected an adapter unit for electrostatic headphones to the SPEAKERS B terminals, you can use the SPEAKERS switches to select your main stereo speakers (A) or the headphones (B).

If you have connected speakers wired for "ambience recovery" to the SPEAKERS B terminals, you can use the SPEAKERS pushbuttons to listen to conventional stereo (A only), to switch off the main speakers and listen only to the stereo L-minus-R "difference" signal in the rear speakers (B only), or to listen to spatially enhanced stereo (both A and B depressed). You will find that the stereo difference signal is usually lacking in bass. If the difference signal is very weak, the recording lacks stereo separation.

3. INPUT LEVEL

The Normal inputs are equipped with separate input level controls for the two channels. Normally both controls should be set in the center. But there are several circumstances in which other settings may be useful:

(1) **Level-Matching.** In a multi-amplifier system, use these controls to match the output of this amplifier to others in the system.

(2) **Extended Volume-Control Range.** Many stereo systems have so much voltage gain that the speakers (or your ears) are over-driven at any preamplifier Volume-control setting higher than 11 or 12 o'clock. As a result you are confined to using only the lower half of the Volume control's range, where adjustments are imprecise and where most Volume controls produce channel-balance errors.

The solution is to turn the amplifier's input-level controls down part way (to about 9 o'clock, for example) in each channel. Now you can turn up your preamplifier's Volume control further, making effective use of its range.

(Suggestion: adjust the power amplifier's input level controls so that you preferred maximum sound levels usually occur at about 2 or 3 o'clock on the preamplifier's volume control.)

As an added benefit, this procedure suppresses any noise produced by the preamp's high-level circuitry (e.g. any residual hum or hiss that does not go away when the Volume is turned down).

(3) **Balance Correction.** Small errors in channel balance can dramatically degrade the apparent "depth" and "air" of the stereo image. Such balance errors may be due to normal production-line differences in speaker sensitivity, differences in the acoustic environment around the two speakers, and slightly different distances from your chair to each speaker. You can use the input-level controls to correct these fixed

balance errors, freeing your preamplifier's balance control to correct balance errors in recordings.

Switch the preamp to mono and sit in your normal listening location. Ideally the "phantom" central image should seem to be floating in mid-air halfway between the left and right speakers. If it is located off-center, closer to one speaker, turn down the input-level control for that channel slightly in order to center the phantom mono image. Then restore the preamp to normal stereo operation.

If you have turned the input-level controls down partway to adjust the overall volume level, do this balance correction as the final step.

NOTES: In the bridged mode, the volume is adjusted with the Left input control only. The LAB inputs are not affected by the Input Level controls.

4. SOFT CLIPPING INDICATOR

This amber LED glows when the Soft Clipping switch (on the rear panel) is ON.

5. PROTECTION INDICATOR

The amplifier can safely and cleanly drive impedances as low as 2 ohms with wide-range musical signals whose peak level is 150 watts or more. But if called upon to deliver high power *continuously* into a low impedance, the output transistors may overheat. In this case, protection relays will automatically disconnect the speakers and the PROTECTION light will illuminate.

If this occurs, switch off the Power. When the output stage cools, the relays will automatically re-connect the speakers, and normal operation can be resumed. In most cases a very slight reduction in volume level will prevent further interruptions in the sound.

If the protection relays interrupt the sound frequently, several possible causes should be considered: a loose strand of wire causing a partial short-circuit between speaker terminals, or continuous high-power operation into a very low impedance in the Bridged mode, or any obstruction of the free flow of air needed to ventilate the amplifier and dissipate its heat.

If the protection relay interrupts the sound even when the amplifier is cool, return the amplifier to your NAD dealer for service. The protection circuit may be responding to protect the speakers from an internal fault, such as an improper DC voltage at the speaker terminals.

IN CASE OF DIFFICULTY: A TROUBLE-SHOOTING GUIDE

SYMPTOM	POSSIBLE CAUSE
No sound.	Power not on. Line cord unplugged. Circuit breaker has operated to protect the amplifier from short-circuited speaker wires or from overheating caused by overdriving the amplifier into a low impedance with the Impedance selector at 8 ohms. (To re-set circuit breaker, switch Power off and allow amplifier to cool.) Internal fuses blown; return amplifier to dealer for service.
No sound in one channel.	Input Level control turned down in one channel. Loudspeaker connecting wire pulled loose (check all connections, both at speakers and at the amplifier). Input cable pulled loose or making poor contact in socket. Rotate plugs in sockets to restore contact. Short-circuit in a defective input cable. Wiggle cables, especially where they enter plugs.
Weak bass; diffuse stereo imaging.	Speakers wired out of phase. Swap connections at the back of ONE speaker.

CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK. DO NOT REMOVE COVER (OR BACK). NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL

WARNING: TO PREVENT FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

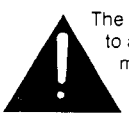
NOTE to CATV system installer: This reminder is provided to call the CATV system installer's attention to Article 820-22 of the NEC that provides guidelines for proper grounding and, in particular, specifies that the cable ground shall be connected to the grounding system of the building, as close to the point of cable entry as practical.

NOTE: Some NAD components are equipped with dual or multi-voltage transformers (which is indicated on the back panel). If you wish to change the voltage, please bring your unit to an authorized NAD service technician for internal conversion.

CAUTION: TO PREVENT ELECTRIC SHOCK DO NOT USE THIS (POLARIZED) PLUG WITH AN EXTENSION CORD, RECEPTACLE OR OTHER OUTLET UNLESS THE BLADES CAN BE FULLY INSERTED TO PREVENT BLADE EXPOSURE.

ATTENTION: POUR PRÉVENIR LES CHOCS ÉLECTRIQUES NE PAS UTILISER CETTE FICHE POLARISÉE AVEC UN PROLONGATEUR, UNE PRISE DE COURANT OU UNE AUTRE SORTIE DE COURANT, SAUF SI LES LAMES PEUVENT ÊTRE INSÉRÉES À FOND SANS EN LAISSER AUCUNE PARTIE À DÉCOUVERT.

The lightning flash with arrowhead, within an equilateral triangle, is intended to alert the user of the presence of uninsulated "dangerous voltage" within the product's enclosure; that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user of the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.